UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,125	07/11/2003	James D.B. Smith	2003P10020US	4105

7590 02/08/2005

Siemens Corporation
Intellectual Property Department
170 Wood Avenue South
Iselin, NJ 08830

EXAMINER	
FEELY, MICHAEL J	

ART UNIT	PAPER NUMBER
1712	

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/618,125	SMITH, JAMES D.B.	
	Examiner	Art Unit	
	Michael J. Feely	1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-10 and 12-22* is/are rejected.

7)☒ Claim(s) *3 and 11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *0703*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1-13 are objected to because of the following informalities: on line 2 of claim 1, "HCT-oligomers" should be replaced with --HTC-oligomers--. Claims 2-13 are objected to because they are dependent from claim 1. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 4-10, 12, 13, and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Campbell et al. (Pub. No. 2004/0102529).

Regarding claims 1, 2, 4, 6-8, 10, and 13, Campbell et al. disclose: ***(1)*** a method of making homogeneous LCT-epoxy polymers with HTC-oligomers (Abstract; paragraphs 0012 and 0016) comprising: grafting at least one functionalized organic group onto at least one nano-sized HTC-material to produce HTC oligomer product (Abstract; paragraphs 0025-0028); reacting said HTC-oligomer product with at least on LCT-epoxy resin under sufficient conditions to form a uniform dispersion and an essentially complete co-reactivity of said HTC-oligomer product with said at least one LCT-epoxy resin, wherein a mixture is formed (paragraphs 0029-0033); and curing said mixture to produce said homogeneous LCT-epoxy polymers with HTC-oligomers (paragraphs 0029-0033);

(2) wherein said at least one nano-sized HTC-material comprises at least one of alumina, silica and a metal oxide (Abstract; paragraph 0025);

(4) wherein the grafting of said at least one organic group onto said at least one nano-sized HTC-material is performed by at least one of a silane grafting and a free radical grafting (Abstract; paragraphs 0025-0028);

(6) wherein reacting said HTC-oligomer product with said at least one LCT-epoxy further comprises warming until said mixture is clear (paragraphs 0028-0029);

(7) further comprising mixing at least one anhydriding agent with at least one of said at least one LCT-epoxy resin and said HTC-oligomer product, wherein said homogeneous LCT-epoxy polymers with HTC-oligomers are a homogeneous LCT-epoxy anhydride polymers with HTC-oligomers (paragraphs 0033-0034); *(8)* wherein said anhydriding agent is taken from the group consisting of 1-methylhexahydrophthalic anhydride and 1-methyltetrahydrophthalic anhydride (paragraph 0034);

(10) further comprising mixing at least one vinyl agent with at least one of said at least one LCT-epoxy resin and said HTC-oligomer product, wherein said homogeneous LCT-epoxy polymers with HTC-oligomers are a homogeneous LCT-epoxy vinyl polymers with HTC-oligomers (paragraph 0043); and

(13) wherein said mixture is added to an electrical insulator as a coating before curing (paragraphs 0048-0049).

Campbell et al. are deficient in that they do not explicitly disclose: (1) a ratio of HTC-oligomer to LCT-epoxy resin of between 1:4 and 3:1 (20-75%) by weight; and (2) an overall dielectric strength of at least 1.2 kV/mil.

Regarding (1) the ratio of HTC-oligomer to LCT-epoxy resin, Campbell et al. add colloidal silica, functionalized with organoalkoxysilane, to curable epoxy formulations (including biphenyl type epoxy system) in order to provide a formulation with a low viscosity prior to curing and a low coefficient of thermal expansion after curing *(see paragraph 0012)*. The functionalized silica acts in place of traditional fillers in order to enhance the physical properties of epoxy formulation. As with all filler/resin systems, the quantity of the filler is adjusted in order to optimize flow/structural properties, along with overall physical and/or electrical properties of the cured product. Hence, the proportion of HTC-oligomer and LCT-epoxy resin is a result effective variable. It should also be noted that applicant fails to demonstrate criticality for this claimed range.

In light of this, it has been found that, "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." – *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955); and, "A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation." – *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the claimed ratio range of 1:4 to 3:1 of HTC-oligomer to LCT-epoxy in the composition of Campbell et al. because it has been found that where the general conditions of a result effective variable are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.

Regarding (2) an overall dielectric strength of at least 1.2 kV/mil, it appears that this property would have been an inherent feature in Campbell et al. because this obvious composition satisfies the chemical requirements of the instant invention. It has been found that, "Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Regarding claim 5, *the teachings of Campbell et al. are as set forth above and incorporated herein*. As discussed above, the proportion of HTC-oligomer and LCT-epoxy resin is a result effective variable, and applicant fails to demonstrate criticality for this claimed range.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the claimed proportion of 20-50 wt% of HTC oligomers in the composition of Campbell et al. because it has been found that where the general conditions of a claimed result effective variable are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.

Regarding claim 9, Campbell et al. do not explicitly disclose a concentration of 20-40 wt% of anhydriding agent; however, applicant fails to show criticality for this range. Furthermore, one skilled in the art would have readily recognized that the quantity of hardener in an epoxy resin composition is a result effect variable that ensures adequate curing of the resin system.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the claimed range of 20-40 wt% of anhydriding agent in the composition of

Campbell et al. because it has been found that where the general conditions of a claimed result effective variable are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.

Regarding claim 12, Campbell et al. do not explicitly disclose a concentration of 4-16 wt% of vinyl agent; however, applicant fails to show criticality for this range. Furthermore, it should be noted that Campbell et al. use this vinyl agent as a reactive diluent to decrease viscosity of the overall formulation. Hence, the quantity of this reactive diluent is a result effective variable.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the claimed range of 4-16 wt% of anhydriding agent in the composition of Campbell et al. because it has been found that where the general conditions of a claimed result effective variable are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.

Regarding claims 18-22, *the teachings of Campbell et al. are as set forth above and incorporated herein.* The only limitations not discussed above are:

(1) a thermal conductivity in the transverse direction of at least 0.50 W/mK and in the thickness direction of at least 0.99 W/mK in an environment of 25°C; and

(2) wherein said homogeneous LCT-epoxy polymers with HTC-oligomers are substantially free of particle wetting and micro-void formation.

It appears that these properties would have been inherent features in Campbell et al. because this obvious composition satisfies the chemical requirements of the instant invention. It has been found that, "Products of identical chemical composition can not have mutually exclusive

properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990)

4. Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Campbell et al. (Pub. No. 2004/0102529) in view of Smith et al. (US Pat. No. 6,384,152).

Regarding claims 14-17, *the teachings of Campbell et al. are as set forth above and incorporated herein.* The only limitations not discussed above are: ***(14)*** impregnating said mixture onto an electrical insulator; ***(17)*** wherein said electrical insulator is a mica/glass insulating tape.

As mentioned above, the advantage of the composition taught by Campbell et al. is that it provides an epoxy formulation with a low viscosity before cure and a cured product that has a low coefficient of thermal expansion *(see paragraph 0012)*. Specifically, the desired viscosity is between about 50-100,000 cps @ 25°C *(see paragraph 0012)*. In addition, Campbell et al. disclose that their composition is useful in numerous electrical applications *(see paragraphs 0048-0049)*; however, they do not explicitly disclose an impregnated mica/glass insulating tape.

Smith et al. disclose an epoxy resin composition useful for impregnating mica/glass insulating tapes. They disclose that there is a need for an insulating epoxy resin system with a low viscosity that makes it suitable for vacuum impregnation *(see column 1, lines 50-63)*. Specifically, a viscosity of 10-150 cps @ 25°C is desired *(see column 2, lines 9-31)*.

In light of this, the resin system of Campbell et al. appears to be suitable for mica/tape impregnations because its viscosity range overlaps the desired viscosity range set forth in Smith et al.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the resin system of Campbell et al. in the mica/glass tape of Smith et al. because the resin system of Campbell et al. provides an epoxy formulation with a low viscosity before cure and a cured product that has a low coefficient of thermal expansion.

Allowable Subject Matter

5. Claims 3 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 3, Campbell et al. is the closest prior art; however, they provide no motivation to substitute their silica for magnesium oxide.

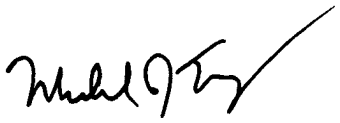
Regarding claim 11, Campbell et al. is the closest prior art; however, they provide no motivation to use p-vinylphenylglycidylether as their vinyl agent.

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Feely whose telephone number is 571-272-1086. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Michael J. Feely
Patent Examiner
Art Unit 1712

February 4, 2005